

Claims

1. A horizontal atmospheric furnace, in particular for the thermal treatment of metallic workpieces (11) at high temperatures, comprising a preferably cylindrical furnace chamber (2) and a furnace door (12) that closes the furnace chamber (2) in a gas-tight manner, wherein the furnace door (12) is mounted in a displaceable manner within a door case (13) that forms a lock which can be closed in a gas-tight manner.
2. A horizontal atmospheric furnace according to claim 1, characterized in that the door case (13) comprises means for a gas-tight connection to a correspondingly formed counter-module.
3. A horizontal atmospheric furnace according to one of the claims 1 or 2, characterized in that the furnace door (12) can be preferably displaced vertically with respect to the longitudinal direction (20) of the furnace chamber (2).
4. A horizontal atmospheric furnace according to one of the preceding claims 1 through 3, characterized in that a thermal treatment can be carried out at temperatures comprised between 400°C and 1050°C.
5. A horizontal atmospheric furnace according to one of the preceding claims, characterized in that the door case (13) comprises a gas discharge means (23).
6. A horizontal atmospheric furnace according to one of the preceding claims, characterized in that the furnace chamber (2) comprises gas inlets (14, 15) formed in the furnace chamber wall and/or a burning-off means (16).
7. A horizontal atmospheric furnace characterized by a gas circulation device (9) placed inside said furnace chamber (9).

8. A horizontal atmospheric furnace according to one of the preceding claims, characterized by several bar-shaped heating elements (8) that extend in the longitudinal direction (20) of said furnace chamber (2) and are arranged in the way of a drum turret.
9. A horizontal atmospheric furnace according to one of the preceding claims, characterized in that the gas circulation device (9) is a ventilator driven by a motor, wherein the drive unit (10) of the ventilator is placed outside said furnace chamber (2), such that is accessible from outside.
10. A horizontal atmospheric furnace according to one of the preceding claims, characterized in that a transport device (21) for receiving workpieces (11) to be thermally treated, which can be displaced on rails (6) in the longitudinal direction (20) of said furnace chamber (2), is arranged inside said furnace chamber (2).
11. A method for the thermal treatment of in particular metallic workpieces in a horizontal atmospheric furnace, in which the workpieces to be thermally treated are supplied to the atmospheric box furnace by means of a transport chamber that is arranged in a relatively displaceable manner with respect to the atmospheric box furnace, wherein
 - in a first step, the transport chamber that is eventually filled with protective gas is coupled in a gas-tight manner to the door case of the atmospheric box furnace,
 - in a second step, the volume space encapsulated by the door case as well as, if necessary, the transport chamber are swept with protective gas,
 - in a third step, the workpieces to be thermally treated are transferred from the transport chamber into the atmospheric box furnace in protective gas atmosphere and
 - finally in a fourth step, the workpieces that have been transferred into the atmospheric box furnace are thermally treated in protective gas.

12. A method according to claim 11, characterized in that after completion of a thermal treatment the workpieces are supplied to a quenching chamber by means of the transport chamber, wherein

- in a first step, the thermally treated workpieces are transferred in protective gas from the atmospheric box furnace into the transport chamber that has been coupled in a gas-tight manner to the atmospheric box furnace,
- in a second step, the transport chamber and the atmospheric box furnace are closed in a gas-tight manner,
- in a third step, the volume space formed by the door case, is swept with nitrogen gas,
- in a fourth step, the transport chamber is decoupled from the atmospheric box furnace,
- in a fifth step, the transport chamber is displaced towards the quenching chamber and coupled in a gas-tight manner to the quenching chamber,
- in a sixth step, the air is swept out of the volume space formed by the door case between transport chamber and quenching chamber with nitrogen gas,
- in a seventh step, the workpieces are transferred in protective gas from the transport chamber into the quenching chamber after opening the doors of both chambers and
- finally in an eighth step, the workpieces that have been transferred into the quenching chamber are quenched after closing the doors of the two chambers.

13. A method according to claim 12, characterized in that the atmospheric box furnace is swept with protective gas before a transfer of the workpieces into the transport chamber.

14. A method according to claim 12, characterized in that the transport chamber is swept with protective gas after a transfer of the workpieces into the transport chamber.